endeavours to describe its past and predict its future experience in the briefest possible terms. It is this creation of *Naturgesetze* by the mind, this invention of brief formulæ, which is at once the glory and limitation of science. The mind does not explain for us what the world of *Dinge an sich*, which we term nature, may be in and for itself; it seeks with all its ingenuity to describe *bildlich symbolisch*, what falls within the limits of its experience. The progress of science lies in the increasing comprehensiveness and brevity of its descriptions.

Prof. Volkmann tells us that:

"So lange die Naturwissenschaften mit einem inneren Verhältnis zwischen Geist und Natur arbeiteten, war ihr Fortschritt gehemmt" (p. 123).

If this were true, then must natural science and the discovery, or rather *invention* of natural law be for ever retarded, for science must always work at this very relation between mind and nature. It is, however, not the right but the wrong appreciation of the relation of mind to nature which checks scientific progress. The completion of the revolution we have hinted at in this review, so far from being detrimental to natural science, will go a long way towards freeing its workers from the attacks which have been made upon science from more than one quarter, and which have largely arisen from a confusion of the idea of mechanism with some form of materialistic theory. Released from the need of replying to external criticism and attack, science will have the more energy and leisure to progress quietly in its own proper field.

KARL PEARSON.

OUR BOOK SHELF.

Text-Book of Comparative Anatomy. By Dr. Arnold Lang. Translated into English by Henry M. and Matilda Bernard. Part ii. (London: Macmillan and Co., Ltd., 1896.)

THIS volume of Dr. Lang's text-book treats of the Mollusca, Echinodermata, and Enteropneusta. To the first group of animals 283 pages are devoted, and to the latter two 319. The complete and systematic manner in which the structure and relations of the different families and orders described in this work are dealt with, renders each of the three chapters, into which the book is divided, a valuable monograph. Regarding the phylogeny of the Enteropneusta, Dr. Lang states that they "are not closely related to any single large division of the animal kingdom"; his treatment of them in this volume is sufficient evidence that he is not inclined to attach much weight to their supposed affinities with the Chordata. In a short notice it is quite impossible to give any idea of the interesting way in which the book is written. The English translation is all that could be desired; the illustrations are excellent. The arrangement of the subject-matter has been carefully thought out, and reference to any subject is assisted by the use of different kinds of type in the text. A long classified list of the important literature is given at the end of each chapter.

Experience: a Chapter of Prolegomena. By the Rev. Wilfrid Richmond. Pp. iv + 64. (London: Swan Sonnenschein and Co., Ltd., 1896.)

ACCORDING to the author, the initial obstacle to the progress of philosophy is the doctrine that experience cannot give the knowledge of reality—that nothing can be definitely known. This view he demolishes by showing that reality is actually to be found within the field of experience, whence the sensible conclusion is arrived at that "experience is the beginning and end of philosophy."

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. *No notice is taken of anonymous communications.]*

Icelandic Earthquake Recorded at Paris.

LE No. de NATURE du 15 octobre contient une note très intéressante de Dr. J. Stefansson, sur le tremblement de terre survenu en Islande le 26 août dernier.

J'aì l'honneur de vous informer que les courbes relevées, à cette date, au magnétographe de l'Observatoire du Parc Saint-Maur, portent nettement la trace de trois troubles particuliers, paraissant se rattacher à ce phénomène. Le premier s'est produit à 11h. 36m., et les deux autres, qui sont plus accentués, respectivement à 11h. 42m. et 11h. 46m. du soir, temps moyen de Paris.

TH. MOUREAUX.

Observatoire du Parc Saint-Maur, le 29 octobre.

Earth Tremors at Edinburgh between August 25 and September 6.

IN connection with Dr. J. Stefansson's article in NATURE of October 15, on the "Recent Earthquakes in Iceland," it may be of some interest to note that the photo-recording bifilar pendulum, presented to this Observatory by M. d'Abbadie, and placed under my care by Prof. Copeland, exhibits on the dates given by Dr. Stefansson several strongly marked irregularities in the curve, which may possibly have had their origin in the Icelandic disturbances. The following table contains a list of all the pendulum oscillations recorded on the photographs between August 25 and September 6, with the Greenwich Mean Times of their occurrence.

	Earth-quakes in Iceland.	Edinburgh pendulum oscillations.		Tilt of pendulum frame.	
		Begin.	End.		
Aug. 25		9.25 a.m.	?	0·4″	Slight.
,,		4.45 p.m.	5.50 p.m.	0·6	Slight.
26		9.10 a.m.	11.5 a.m.	0·4	Very slight.
,,		0.55 p m.	2.10 p.m.	1·0	Slight, but well-marked.
,,	10.30 p.m.	11.10 p.m.	11.30 p.m.	About 2	Gap.
27		6.35 a.m.	?	1·25	Well-marked.
,,	9 15 a.m.	10.50 a.m.	11.5 a.m.	About 2	Gap.
,,		4.10 p.m.	5.40 p.m.	0·5	Very slight.
29		11.20 a.m.			Several almost imperceptible tremors at irregular intervals.
30			4.30 p.m.		
30		4.30 p.m.			No trace of disturbance, but record not complete.
Sept. 4			4.50 p.m.		
4		4.50 p.m.			Photographic trace a perfectly straight line.
6			0.5 a.m.		
5–6	11.30 p.m.	0.5 a.m.	0.20 a.m.	2 to 3	Gap.
6	2 a.m.	No dis	turbance	here.	
,,		9.5 a.m.	?	1·0	Well-marked oscillation.

The points of special interest in this table are the three violent oscillations which have been designated gaps. These are complete interruptions in the curve, caused apparently by successive waves of sufficient amplitude to produce so rapid an oscillatory motion of the pendulum, that the reflected ray traverses the exposing slit too quickly to leave any photographic trace. The result as seen on the photograph is an abrupt termination to the curve line; then for a period of from five to ten minutes no photographic effect whatever is produced, and for about a similar period, a widened and badly defined trace shows that the ray has oscillated to each side of its normal position, with an amplitude of disturbance at the time when the trace begins to reappear of fully 2″, but which must have been considerably greater at the beginning of the gap, where the record is altogether wanting. After this the mirror comes to rest, and the ordinary trace reappears.

In the case of all the smaller irregularities of the curve, the ray seems to have moved more or less abruptly to a distance from its normal position, after which the mirror gradually settles to rest. Careful measurements give, for the arc through

© 1896 Nature Publishing Group

which the pendulum frame is tilted, the numbers contained in column 5.

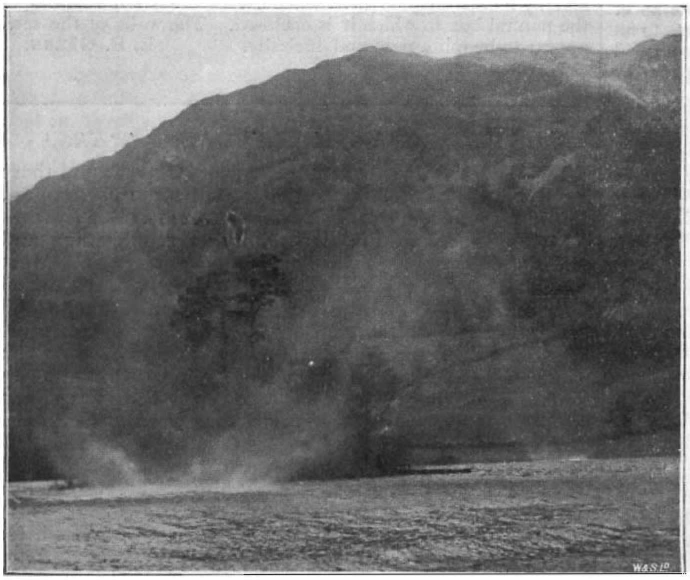
Unfortunately, between August 30 and September 4, the record is incomplete, some fifty hours having been lost by the photographic paper repeatedly running so much to one side as to stop the clock. This difficulty, it is hoped, has now been overcome.

THOMAS HEATH.

Royal Observatory, Edinburgh, October 26.

Whirlwind on "Rydal Water."

SOME friends and myself were staying at Lowwood Hotel, Windermere, for a few days, and on Friday, October 16, we were walking by "Rydal Water," on the opposite side from the road, when we noticed a very curious and most unusual effect on the water, caused by a sudden very heavy squall of wind, which seemed to come from two directions at one time, creating a "whirlwind," and raising the water and spray on the lake fully 100 feet high or more. There were eight or ten of these disturbances during the time we stayed (probably about twenty minutes), and I was fortunate enough to have my hand-camera with me and to photograph the largest of them, which came sweeping down the lake towards the island (near the centre), and finally broke on the shore with a boom like a cannon, which threw the débris, &c., at the side into the air quite 40 feet high. I have seen small whirlwinds strike on various lakes, but never anything of the magnitude of this. Thinking the incident might be of interest to you, I send you a photograph to make what use of you like.



Whirlwind on "Rydal Water," and smaller one in distance, October 16.

Had a small boat or ordinary Windermere yacht been caught in one of these whirlwinds, she must have been swamped.

HENRY J. C. ANDERSON.

Rodono, Great Crosby, near Liverpool, October.

The "G" Section of the British Association.

PERHAPS I may be allowed to make a few remarks concerning the above Section, and the strictures passed on October 22 upon its work, by the writer of the report in your columns. The writer is not singular in his criticisms, for others representing the scientific and practical sides of engineering also speak from time to time in a disparaging way, both of the subjects themselves, which are dealt with under the head of Mechanical Science at these annual gatherings, and of the methods of dealing with them.

I am not in any way concerned in defending the present state of things, but I would point out that no one yet seems to have suggested any really better general plan of carrying on the business of the Section. The writer in your columns indicates, for instance, that the week should be devoted to discussions such as that upon the fracture of railway rails, or the report on tidal influences. While admitting the value of these two communications, and others of a similar kind, there appear to be serious objections to limiting the work of the Section entirely to such matters, which work, I venture to think, your reporter entirely mistakes in its relation to technical societies. These societies, such as the Institutions of Mechanical Engineers, of Naval Architects, of Electrical Engineers, of Mining Engineers, and the Iron and Steel Institute, specialise their work, and deal often in a different way with quite different subjects. Now the British Association affords a common meeting ground for all interested in these and other branches of applied science, and, indeed, for many who may not have any special knowledge of any branch at all. Hence papers, or even lectures, upon which discussion is admitted and invited, dealing with dock works (which surely it is quibbling to exclude from the range of mechanical science), electric railways, the Tower Bridge, waterworks, not to say of armour and ordnance, of wreck-raising, of motor carriages, &c.—in all of which an account was given of progress in applied science—seem to form an important part of the work of the Section. Indeed, those authors who took the trouble to prepare illustrations, lantern slides, and models to make their subject clear and interesting, or even, if you like, "popular," deserve the hearty thanks of those present.

It might perhaps be a good thing to make some division in the day, so that the scientific papers and discussions which, to be frank, frequently empty the room, might be taken early before a certain hour, after which papers of a more popular character might be announced for reading and discussion.

As for trade articles, it might be fairly argued that new inventions not coming under that head—even scientific instruments, for example—have generally no value or interest at all; and the Committee of the Section seem always to try and ascertain, before accepting a communication of this sort, if there is sufficient novelty and scientific interest to warrant its acceptance; and in this matter, the "morality" of the Section need not be higher than that of technical societies. Indeed, if advertisement were a ban to acceptance, a good many of the authors themselves at most of the Sections would be hopelessly rejected. The "touting circular" referred to, if indeed it can be called such, was given out by one of the secretaries to only a portion of the meeting, and the remaining copies withheld when his attention was called to the contents. It is scarcely right to intimate that this sort of thing ever occurs except as a rare accident.

H. S. HELE-SHAW.

Walker Engineering Laboratories, University
College, Liverpool, October 26.

P.S.—Mr. Johnson, of Derby, is mentioned in mistake for Mr. R. E. Johnston, Engineer of the Joint London and North-Western and Great Western Railways.

Suggested Reef Boring at the Bermuda Islands.

THE issue of NATURE containing the notice of the failure of the Royal Society boring expedition has just reached me, so I hasten to call attention to the great value of the Bermudas as a permanent home for a scientific station, and where borings might be readily conducted at any convenient time. A glance at the map will show that the fauna of the deep sea, of coral reefs, the avifauna of the ocean, and a complex meteorology, may all be studied at one and the same station, and in close proximity to New York and Halifax.

Could the Smithsonian Institution or the Royal Society be induced to take the matter up, it would seem to be an easy matter to organise a station, as the funds required are not large.

The town of St. George's very probably would give a dock with house attached, and possibly the colony a small sum annually. If the Universities of America would take an interest in the matter, the enterprise might be immediately pushed along

© 1896 Nature Publishing Group